

Aircraft Operations Division User's Guide	JSC Reduced Gravity Program User's Guide	
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APPENDIX I

PRE-SHIPMENT EQUIPMENT READINESS CHECKLIST

This checklist was adapted from the Deutsche Luft-und Raumfahrt (DLR) *KC-135 Test Equipment Inspection Procedures*. As overseas veterans of numerous zero-g campaigns, DLR is uniquely qualified to recommend a final, pre-shipment equipment checklist. However, this checklist, although useful during packing preparations, does not replace the safety requirements outlined in this document.

A. General

Has the flight equipment been identified? Has the ground equipment been identified?
Have the flight procedures been prepared?

Have the contingency flight procedures been prepared (power failure, computer failure, need for spare batteries, etc.)?

Have the operational limits been defined?

Has the detailed structural analysis been performed (takeoff and landing configuration, free-floating test article configuration)?

Has the electrical load analysis been performed?

Is the general workmanship satisfactory (screws and bolts secure, wiring secure, cable routing convenient and safe, components secure on base-plates)?

B. Human Factors

Have all of the corners, edges, and protrusions been padded?

Are all surface temperatures below 113 degrees Fahrenheit?

Are all rotating components contained?

Are all electrical connections covered?

Are there adequate handholds?

C. Electrical System

Are all the cables and connections labeled?

Are all cables adequately restrained or clamped?

Are the cables of adequate length?

Do the cables have adequate strain relief?

Are protection devices (circuit breakers and fuses) provided for each piece of equipment?

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Are all components labeled?

Are the high voltage sources protected and marked with warning labels?

Is the equipment properly grounded?

Are the batteries of the proper type (dry or gel cell only--no liquid electrolyte or lithium)?

Is all insulation properly protected against abrasion?

D. Lasers

Are the type, manufacturer, peak power, pulse length, voltage requirement, and mode of operation documented?

Does the laser comply with ANSI-Z-136.1?

Are interlocks provided?

Is it marked with warning labels?

E. RF Systems

Has an EMC test been conducted?

F. Pressure Systems

Are the design pressure and MAWP specified?

Is the system guarded against any component inadvertently exceeding MAWP?

Does the system have over-pressure protection (automatic controls, relief valves)?

Has the pressure vessel been certified to ASME standards?

Is the certification current? Is the following relief device information included:

Set pressure?

Manufacturer?

Model number?

Component number?

Are the relief devices tagged with the set pressure?

Is the following information included for other components such as valves, regulators, filters, etc:

Manufacturer?

Model number?

Pressure rating?

Component number?

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Have the regulator gauges been certified and tagged or labeled?

Have the pressure gauges been certified and tagged or labeled?

Has proof testing been performed for the following components:

Pressure vessels?

Flex hoses?

Piping system?

Relief valves?

Has proof testing been performed for the fully configured system?

G. Vacuum system

Are the drawings included?

Is the system equipped with relief devices (positive or negative relief valves)?

H. Hazardous Materials

(If possible, avoid high pressure, toxic, corrosive, explosive, radioactive, and flammable materials!)

Is the absolute minimum quantity used for the experiment?

Are the MSDS's included?

Are the materials properly contained?

I. Breakable Items

Are glass monitor screens covered with $\geq 1/16$ -inch Lexan or Plexiglass? Is all glass tubing wrapped or contained properly?

Are any high-temperature viewing ports made of tempered glass?

Are any other viewing ports made of Lexan or Plexiglass?

J. Cleanliness

Is the test article free from drilling debris, excess tape, dust, and loose items (tools, pencils, pens, paper clips, etc)?

K. ADP

Are the manuals included?

L. Transportation

Are the manuals included?

Is the test article properly secured, padded, and ready for transportation?

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Are storage bottles, if any, empty (at zero pressure) for transport?

If not, do they meet DOT regulations?